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ABSTRACT

The acquisition order of four Japanese verbs for the act of clothing was investigated. Each of the verbs investigated corresponds to the act of clothing different body parts. There are two theories for the prediction of acquisition order: the checklist and the prototype theories of word meaning. According to the checklist view, word meanings consist of sets of conditions for appropriate use, with a clear boundary between appropriate and inappropriate use. Under the prototype view, word meanings are characterized in a more complex way, with less clear boundaries between appropriate and inappropriate uses. Eighteen Japanese-speaking children aged 2-4 years were tested on production and comprehension tasks. The results showed that acquisition order conformed to predictions derived from the prototype view of word meaning. The predictions were based on the mapping complexity of ordinary referent situations. (RW)

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ACQUIRING CLOTHING VERBS IN JAPANESE*

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In this study, I examined the acquisition of four Japanese clothing verbs: kaburu for head-coverings, kiru for upper-body garments, haku for lower-body garments, and hameru for close-fitting accessory items.[1] My aims were; to establish (i) the order in which children acquire these verbs and (ii) the strategies children employ in coping with unfamiliar instances of "clothing", and to check which of two theories of word meaning, namely, "checklist" and "prototype", would better account for these facts.

MEANINGS OF THE FOUR VERBS. The four verbs in this study all correspond to put on in English. Kaburu, kiru, and haku are the primary clothing verbs. They roughly distinguish different body-parts by location, but their meanings are not equally specific. Anything can be used for the actions of kaburu as long as it can cover the head, but a garment is required for the actions of kiru and haku. The usual sense of kiru or haku also implies that the garment is worn in the normal way. Kiru and haku locations do not simply divide up the body into two parts: Kiru garments always cover the trunk of the body, and they may extend from there to cover the lower body, the head, or even both, for instance, pyjamas, a hooded raincoat, or a spacesuit. Kiru, therefore, covers the most general domain, and is "unmarked" (see Table 1).

In the case of hameru, neither the location nor the object-located is limited: It is used both for close-fitting small items as a part of clothing actions, and, for instance, for putting a button into a buttonhole. Hameru can also be replaced by another general action verb such as suru 'to do' or tukeru 'to attach' when the context does not demand specificity.[2]

Table 1. Basic meanings of the four verbs.

verb:	basic meaning:	examples (object-located):
KABURU	to cover one's head; not necessarily garments	hat, helmet, hood, scarf (over head), blanket (over head), water (over head), etc.
KIRU	to put a garment on one's trunk; may extend to the lower body and/or the head [unmarked]	shirt, sweater, jacket, dress, overcoat, kimono, hooded raincoat, pyjamas, bathing suit, diving suit, "clothes", overalls, spacesuit, etc.
HAKU	to put a garment on one's lower body [marked]	pants, skirts, socks, stockings, shoes, sandals, boots, etc.
HAMERU	for fitting closely; need not be garments nor on body parts (Suru 'do' or tukeru 'attach' can sometimes replace it.)	gloves, ring, bracelet, wrist watch, false teeth, button into buttonhole, jewel into a gold base, etc.

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ACQUISITION ORDER. Acquisition orders are predicted from the checklist and prototype theories of word meaning (Fillmore 1975, Bowerman 1978, Coleman & Kay 1981).

Under the checklist view, word meanings consist of sets of conditions to be satisfied in order for uses to be appropriate. The extensions of a

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word, under the strong version of this view, always have to be based on all of the conditions. It follows that there is a clear-cut boundary between appropriate and nonappropriate referent situations.

Given a group of related verbs in a semantic field, what order of acquisition is predicted from this view? If we disregard for now the internal conceptual complexity of each condition, and merely consider the number of conditions, one could predict that the child learns words with fewer conditions earlier. A single condition should be less complex than multiple conditons, and it is only natural to assume that children acquire later those structures that are more complex (Chomsky 1969). The reverse order, words with more conditions learned earlier, would contradict this notion of complexity (see, e.g., Clark & Garnica 1974, Gentner 1975).[3]

The meanings of the four verbs are presented in checklist form in Table 2. Based on the number of conditions, the acquisition order should be hameru first, kaburu second, and kiru and haku last. I should point out here that the number of conditions alone may not determine relative semantic complexity in this example because the equivalent conditions are not exactly the same across words. Since it is difficult to measure the relative complexity internal to the kind of conditions, however, I used only the number of conditions:

Table 2. Checklist theory applied to the four verbs.

HAMERU [4]	KABURU	KIRU	HAKU
		O: GARMENT	O: GARMENT
	L: ONE'S HEAD	(L: ONE'S TRUNK)	L: ONE'S LOWER BODY
R: CLOSE-FIT	R: COVER	R: NORMALLY WORN	R: NORMALLY WORN

Note. O: Object-located, L: Location, R: Relationship to be created between O & L.

Under the prototype view, on the other hand, word meanings are characterized as mental "scenes" of "typical" referent situations. The extensions of a word, under this view, need not share exactly the same set of features but are associated in a complex way as in a family resemblance structure (Rosch & Mervis 1975). The boundaries between appropriate and inappropriate instances will be fuzzy (Labov 1973, Andersen 1975).

What order does this view of word meaning predict? The main prediction is that the typical referent situation should be associated with a word earlier than non-typical ones. Two different factors might further affect acquisition order if one assumes that word meaning is learned by processing the actual scene of familiar referent situations; these are frequency (i.e., the more frequently the child experiences the typical referent situations in everyday life, the easier it is to learn the word meaning that derive from them) and perceptual mapping complexity (i.e., a word meaning is easier to learn when the typical referent situations are perceptually or conceptually more constant and salient for the child). The perceptual mapping complexity assumes that it is easier for the child when a word is used to refer to the situations that fall into one catogory (perceptual or conceptual) rather than many categories. This prediction is in accordance with Slobin's (1973, 1984) Operating Principle that one-to-one mapping between a word and a concept (i.e., form and function) is easier than one-to-many mapping.

The relative mapping complexity of the four verbs was measured by the following method: (1) Four perceptual units were identified as the basic event segments shared in the given locative action category: Object-located, Location, Agent's body motion, and the Relationship to be created between the object and the location. The agent category was excluded here because it does not contrast among the verbs in question; (2) Relative rankings, 1 to 4, were assigned to the verbs under each unit. The unit with the simplest mapping among the four was ranked as 1 and that with the most complex mapping was ranked as 4. When the difference between two or more verbs was hard to judge, an equal rank was given. The relative salience among different body-parts was---HEAD more salient than other part and UPPER BODY more salient than LOWER BODY---according to Andersen's (1978) study; and (3) The average rank of all four units was calculated for each verb.

The result of this mapping complexity predicted kaburu to be the easiest to learn, followed by haku then kiru close to each other, and lastly, hameru (see Table 3):

Table 3. Ranking the consistency/salience of referent situations.

basic perceptual units:	Object-located O:	Location L:	Agent's body motion M:	Relationship to be created between O & L R:
KABURU (average =1.6)	need not be garments [3.5]	agent's head [1]	put the head into O [1]	O covers L [1]
HAKU (average =2.3)	garments for lower body [1]	agent's lower body [2]	put the feet into O [3]	garments normally worn [3]
KIRU (average =2.5)	garments for the trunk often extending to the lower body and/or the head [2]	agent's trunk often extending to the lower body and/or the head [3]	put the arms into O (sometimes the head first) [2]	garments normally worn [3]
HAMERU (average =3.6)	need not be garments [3.5]	need not be body-parts [4]	general putting on motion [4]	close-fitting [3]

Note. Relative mapping complexity within each perceptual unit:

1 ⟷ 4

most salient/consistent/transparent mapping (simplest) ⟷ least

The frequency of daily referent situations was obtained by interviewing mothers. The commonest were the actions picked out by kiru and haku, the next most common were those of kaburu, and the least common were those of hameru. This order matched the frequency of these verbs found in Okubo's (1967) longitudinal study of one child's spontaneous production from age 1 to 5. The predicted order of acquisition based on frequency is then kiru

and haku first, then kaburu, and last hameru.

Method. Data were collected from 18 Japanese-speaking children in Tokyo, with six in each of three age groups; 2;6-3;0 (mean age 2;10), 3;6-4;0 (mean age 3;10), and 4;6-5;0 (mean age 4;10) in both comprehension and production tasks. The same tasks were also given to sixteen adults (see Kameyama 1980b).

In the production task, each child was asked to give brief descriptions of 28 locative actions performed by the experimenter using 13 different objects (both garments and non-garments) and usual and unusual actions. The usual (conventional) actions involved garments worn normally. The unusual (unconventional) actions involved either garments worn unusually (e.g., a hat put on the knee) or non-garments used like garments (e.g., a mug placed upside down on the head).

In the comprehension task, each child was asked to perform actions according to 16 verbal commands given by the experimenter. The commands included both usual and unusual combinations of a verb and an object (e.g., haku + 'sock' was usual, but haku + 'glove' was unusual). The production task preceded the comprehension task.

I hypothesized that conventional action-verb associations should be acquired first, and that children's responses to conventional actions or expressions should reveal the usual order of acquisition. Responses to unconventional actions or expressions, on the other hand, should reveal how children cope with unfamiliar actions of 'putting on' and unfamiliar uses of these verbs.

Results and discussion. The production results showed that if a child used a verb at all, (s)he used it for at least one conventional action. Some children used them only for the conventional actions while others extended them to unconventional ones as well. Table 4 below shows the production results for describing conventional actions.

Table 4. Children's production of correct verbs for conventional actions.

actions:		1. hat	2. coat	3. pants	4. sock	5. glove	6. ring
correct verb:		KABURU	KIRU	HAKU		HAMERU **	
number of children who responded correctly:	2 yrs.* total(2)	2	1	2	2	0	0
	3 yrs. (6)	6	4	4	2	1	1
	4 yrs. (6)	5	4	5	5	1	4
TOTAL: (out of 14)		13	9	11	9	2	5
% correct (each action)		93%	64%	79%	64%	14%	36%
% correct (each verb)		93%	64%	71%		25%	

Note: *Four 2-yr-olds were omitted because their responses were irrelevant to the task.

**Seven children (2 to 3 yrs.) used yaru 'to do (colloq.)' for all the hameru-actions (50%).

The order of acquisition inferred from the verbs produced most often for conventional actions was first kaburu (93% correct), second haku (71%), third kiru (64%), and last hameru (25%). Between the two actions for haku, putting on pants was slightly easier than putting on a sock. For hameru, putting on a ring was a little easier than a glove. The developmental difference among age groups was only clear in the case of hameru. Only one child used it from the two younger age groups whereas four children from the 4-year-olds used it at least once. The other three verbs showed considerable individual variation and few differences among age groups.

This acquisition order for production was in general agreement with the comprehension results: Conventional commands were easy to act out correctly because the child only had to know the normal use of the garments. Knowledge of the verb meaning was not necessary for successful responses. Even so, hameru seemed to be more difficult than the other three verbs for the 2-year-olds: Only two could act out hameru + 'glove' whereas five could do commands with the other three verbs.

The order of acquisition among the four verbs was first kaburu, second haku, closely followed by kiru, then hameru last. This order fits the prediction based on the perceptual mapping complexity of the referent situations.

The predictions based solely on frequency was not borne out. Kaburu was easier than haku or kiru despite the fact that it is less frequent. Something facilitates the acquisition of the meaning of kaburu more than that of haku or kiru. This, I argue, is because the ordinary referent situations for kaburu are focused on the head, which is a relatively simple and salient category for young children. The fact that haku is slightly easier than kiru in spite of their similar conditions on use can also be explained by their mapping complexity. The garments for kiru present unclear limits in coverage starting from the trunk, whereas those for haku are limited to below waistline. The result clearly shows the secondary role of frequency overridden by the consistency/salience factor in acquisition.

The predictions based on the number of conditions in the checklist description of the verb meaning was not borne out either. Hameru should have been the easiest because it had only one condition, namely, CLOSE-FIT, but it turned out to be by far the most difficult verb. Why? There could be several reasons: (a) Its mapping complexity: hameru refers to locative actions limited neither to garments nor to body parts. Imagine, for instance, a scene of a button put into a buttonhole and a scene of gloves put on the hand--the common feature is highly elusive; (b) Its relative infrequency: frequency may still play a role even if secondary; (c) The two conventional actions used in the task are relatively infrequent in children's daily life. Buttoning is actually more frequent than putting on gloves or rings; and (d) Many of the referent situations can be conveniently referred to using another verb.

PRAGMATIC STRATEGIES. In production,[5] children's major strategies were; (i) to use a general purpose verb (Clark 1978), yaru 'to do (colloq.)', and (ii) to overextend a few locative verbs already known to them.[6]

The yaru strategy. Yaru is the colloquial form for 'to do'. Seven children relied primarily on this verb, but no adults used it. Five children in this group used yaru as the "last resort" verb, and other two children used it as the "first choice" verb. The last resort group used yaru only when they couldn't find an appropriate verb. All of them used kaburu, kiru,

and haku more or less correctly and relied on yaru for the hameru actions and other unfamiliar ones. In fact, none of the seven yaru-users ever produced hameru (see Table 5):

Table 5. Yaru strategists.

	child (age):	yaru	kaburu	kiru	haku	hameru	others
Yaru as the first choice	#8 (3;10)	86%	3	0	0	0	11
	#15 (5;00)	57%	0	3	14	0	25
Yaru as the last resort	#1 (2;11)	46%	18	14	11	0	11
	#11 (3;11)	46%	14	11	11	0	18
	#7 (3;8)	36%	3	0	3	0	57
	#6 (2;11)	29%	39	0	7	0	25
	#9 (3;11)	21%	25	7	11	0	36

% for producing each verb for 28 actions

The first choice group consistently used yaru for most of the actions, only differentiating the location names, for instance, "Yaru on the head", "Yaru on the hand", and so on. Their yaru thus had a meaning close to put in English.

The use of yaru as the last resort verb seemed to take place before children start producing hameru and other late learned verbs and relying more on overextensions of a few specific verbs to cover unfamiliar instances. In fact, three children in the last resort group had a tendency to overextend just one verb, indicating some continuity to the overextension group. There was also a gradual increase in the average number of different verbs used for describing the 28 actions in these groups (indicated by the arrow in Table 6 below):

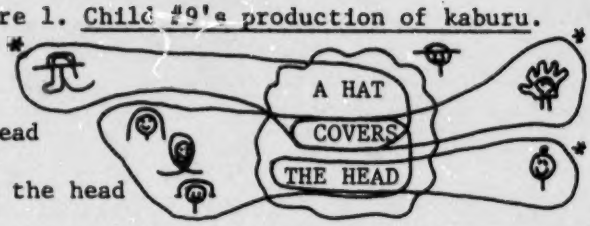
Table 6. Possible developmental continuity in production strategies.

Strategy:	Children:	
Yaru as the last resort	2 yrs old (2), 3 yrs old (3)	I
Overextension of a few verbs	3 yrs old (2), 4 yrs old (2)	II ⇩
Adult-like moderate extensions	4 yrs old (3)	III
(Yaru as the first choice	3 yrs old (1), 4 yrs old (1)	parallel to II)?

The acting-out strategy. In the comprehension task, when the command paired a verb with an unusual object, the younger children made more object-based responses and the older ones, more verb-based responses. The former was when the garment was located on the usual place in the usual way and the latter was when it was made unusual to fit the verb meaning. There was thus a gradual shift from reliance on non-linguistic knowledge to reliance on linguistic knowledge.

Bases for extensions. Children's overextensions in production and their verb-based responses in comprehension revealed some of the bases for the extension of words. Two children overextended kaburu, and two others overextended both kaburu and kiru. Roughly speaking, their bases for extension clustered in a family resemblance structure, implying certain nucleus sources of perceived similarities (as the kick example in Bowerman 1976). In one child's use of kaburu, for instance, the three overextensions seem to have resulted because he wrongly isolated the features found in a typical referent situation, namely, "a hat on the head" (see Figure 1):

Figure 1. Child #9's production of kaburu.


a hat on the knee*
a raincoat over the head
a scarf over the head
a bowl upside down on the head
A HAT
COVERS
THE HEAD
a glove on the fist*
a badge on the head*

Similarly, one such feature wrongly isolated for the extension of kiru was to "put the hand into something". It appeared to be related to the typical body motion to put hands into sleeves. This same feature was in turn acted out in comprehension by some children, by putting a hand into a hat or a sock.

For all four verbs, body-parts as locations appeared to be especially salient. The mapping complexity in terms of body-parts might have been particularly influential in acquisition. (Note the fact that the ratings on the salience of body-parts only would have predicted the same acquisition order. See Table 3.)

CONCLUSIONS. The order of acquisition among the four verbs--kaburu, haku, kiru, then hameru--fits the prediction based on the mapping complexity of ordinary referent situations. This prediction was derived from the prototype view of word meaning based on my view that the "scene" of prototypical referent situations are acquired through children's daily experiences.

The prototype-based meaning acquisition was also compatible with the children's active use of the verbs in production and comprehension. In production, children learned to use the verbs for conventionally associated actions earlier than for others. Extensions of verbs to unusual referent situation were often based on parts of the typical referent situations.

These facts suggest that the given verb concepts under development were closely related to the referent situations children experience in the daily life. Normal uses of daily garments are learned early and play an important role in the acquisition of the meaning of clothing verbs.

FOOTNOTES

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1. Although these verbs have extremely wide variations in both metaphorical and idiomatic usages, the present study is limited to actual locative actions.

2. Hameru belongs to those locative action verbs which encode different manners of contact, and which, when used as clothing verbs, describe actions of putting various accessory items on the body. Other such verbs include: kakeru for suspending (e.g., glasses) and tukeru for attaching (e.g., badges) (see Kageyama 1977, Backhouse 1981).

3. There is a problem in basing predictions solely on the complexity of adult meanings because children may develop their own conditions and continue to modify them during acquisition (Carey 1982). They may also apply their checklists only partially to actual word use (see Clark 1975).

4. Not all "close-fitting" instances are hameru-actions, however (e.g., "sock on foot" is never hameru). It applies only when there is no other conventionally associated verb within the same semantic domain, for "the value of each term results solely from the simultaneous presence of the others" (de Saussure 1916:14).
5. The immediacy of the children's productions was striking despite the fact that their stock of words was more limited than adults'. They could select some word even if it was inappropriate, to refer to a given situation no matter how strange the action was. There were only 12 instances (from six children) when an action wasn't described at all (3% of all instances in the task).
6. To determine children's "overextensions", I assumed that adults' extensions were appropriate.

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